

# AWE EXCHANGE VISIT



# **AWE ALDERMASTON VISIT 9/11-15/2006**

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- Y-12 Participants
  - Manager, Safety Analysis Engineering
  - Manager, EUO Criticality Safety
  - NCS engineer, EUO Metalworking
  - Criticality Safety Officer , EUO Metalworking
  - Fire Protection engineer
- AWE Participants
  - Manager, Major Projects Assurance
  - Manager, Company Assurance Services
  - Facility Assurance (Operations)
  - NCS engineer, Major Projects
  - Manager, Criticality Safety
  - Various others dependent upon discussion topic

# Terminology

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- AWE – Atomic Weapons Establishment (UK) – combined design lab and production facilities
- Assurance – Nuclear Safety
- RCSB – Rackable Can Storage Box
- FMCS - Fissile Material Control System; a computerized movement/accountability system
- Facility Criticality Representative – Criticality Safety Officer
- CCC – Criticality Control Certificate (NCS approval document)
- Safety Case – Documented Safety Analysis
- STAMMP – Storage, Tracking, and Material Movement Project

# Major Activities

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- Discussion of
  - Fissile Material Control System Design
  - EU Periodic Review of Safety Methodology
  - New Construction Activities
  - RCSB NCS studies
  - Fire Assessment Practices
  - Facility Criticality Representative Program
  - NDA and Fissile Material Holdup Activities
  - Casting NCS studies
  - Future Exchange Activities
- Tours/Observations of
  - PU Facility and Fissile Material Control System
  - EU Facility and Fissile Material Control System



# General Observations

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- Facilities were clean, well lit, and well maintained. Pu facility relatively new, EU facility comparable age to Y-12.
- Maintenance appeared to be a priority. Although improvements are under consideration, most of the facility and equipment appeared to be well maintained.
- Holdup not a major issue as filter replacement and equipment cleanout is scheduled and performed on a regular basis.

# **Fissile Material Control System**

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- **Part of AWEs Criticality Management System, addresses material moves, accountability, security, and limited processing.**
- **Centered around “Criticality Stations” (workstations, generally a glovebox), what is there, what allowed to be there, and movement between stations.**
- **Local data entry at stations requesting move**
- **Moves subject to various checks**
  - Route walkdown
  - Two operators confirming material data and requesting move
  - Two Material Controllers reviewing request (not all requirements are programmed into the system) and approving move
  - Computer verification that move is allowed (primarily mass limits)
- **Various sensors and alarms if move is not allowed or if executed different than plan**
- **Moves take time to execute, longer between bays than between adjacent stations**

# Facility Observations

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- Observed equivalent of machining and casting areas
- The entire CCC is posted. Usually a page or two, covers administrative controls only
- Filters are changed out based upon either time or of number of runs
- Equipment and gloveboxes also subject to periodic cleanout. Ducts have flanges to allow cleanout if necessary
- Effect of equipment cleanout and filter replacement: holdup not a real issue
- In process can storage includes physical restraints and relatively large spacing.
- Birdcage contents stored under workstations count as part of workstation limit.

# New Construction Activities

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- Various new facilities under consideration
- No wet chemistry operations are included, but storage is.
- Gloveboxes/enclosures throughout
- Modified RCSB for storage (note that would include use for in-process storage)
- Faced budget issues, resulting in reduced footprint and redundancy. Hope to preserve redundancy for major equipment using bag-out ports
- Considering RFI technology for container ID
- Proposed casting limits were discussed

## **RCSB usage**

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- Intend to use the RCSB concept materials with modification
  - Borated material above and below fissile material
  - Variation in storage hole size for AWE needs
  - Borated material considered defense in depth for in-process storage
- Overall, independent calculations support the design

# Facility Criticality Representatives

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- Several assigned, are trained and approved by NCS manager
- Part-time assignment
- Functions:
  - CCC rule implementation (admin only)
  - Modification control board member
  - Collect information/data for emergency response
- Created in part to assist in assuring coordination between Operations and NCS engineers and to prioritize NCS engineering activities



# NDA and Holdup

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- AWE does surveys, but not nearly to the extent done at Y-12.
- In place of an extensive survey program, AWE cleans equipment out periodically. Basically, they develop a “loss” rate per operation, determine the number of operations to “lose” a target amount of material, then cut that number in half and require cleanout after that number of operations.
- Periodic review meetings (Total Material Control Review – includes NDA, NCS, Material Control managers) and annual oversight review of the process.

# Future Exchange Topics

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- Long term (3 – 6 months) engineer exchange
- NCS interface with major projects (what, when, how?) to assure maximum use of design features
- Impact of DOE-STD 1189
- Poison usage – how handle
- Updates on FMCS and STAMPP
- Computer modeling of holdup
- Interface between NCS and NDA. How use NDA data? How much credit on NDA results? How much reliance on monitoring programs?
- Release fractions and seismic studies in DSA
- Fire risk assessments
- Facility Safety/NCS interface and Safety Case methodology
- Shielding assessment/performance

# Failure to follow local traditions

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